

Yale Tobacco Center of Regulatory Science

Effects of Flavors on Nicotine Choice and Central Reward Mechanisms (Project 1)

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Abstract:

The goal of this project is to examine whether menthol, and potentially other flavors, counteracts the initial aversive effects of nicotine and tobacco aromas in new consumers of dissolvable tobacco products, and whether in chronic consumers, sweeteners and menthol increase the addictive properties of tobacco products by enhancing central dopaminergic mechanisms. Nicotine, tobacco constituents and added flavors exert complex effects on the peripheral neuronal systems mediating flavor perceptions (somatosensory, olfactory and gustatory) and on central reward circuits in the mesolimbic dopamine (DA) system. In preliminary studies in mice the investigative team has observed that menthol and sweeteners (xylitol, sorbitol) increased oral nicotine consumption. In the rat model system, they observed that nicotine, menthol and oral tastants increased phasic DA release in the nucleus accumbens that underlies the hedonic valence of primary rewards and reflects the reinforcing properties of such rewards. Therefore, they propose to: Determine whether flavor constituents in dissolvable tobacco products alter oral nicotine intake (Aim 1), and examine whether flavor constituents of dissolvable tobacco products increase nicotine reinforcement and nicotine-taking by enhancing phasic DA release (Aim 2). Flavor effects will be compared in choice paradigms in adolescent and adult mice, and in mice deficient in receptors for menthol and sweeteners (TRPM8, TRPA1, T1R2/3). Fast scan cyclic voltammetry and flavor receptor inhibitors will be used to examine flavor effects on DA release.